0050

UtahAmerican Energy, Inc.

6750 North Airport Road, P. O. Box 902, Price, Utah 84501
Phone: (435) 637-5385
Fax: (435) 637-8860

October 9, 2006

Utah Division of Oil, Gas & Mining
Coal Program
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

c/007/0019
#2671

Attn: Pamela Grubaugh-Littig
Permit Supervisor

Re: Cenennial Project (Tower Mine), C/007/0033, Water Monitoring

Dear Ms. Littig,

Enclosed with this letter is a new water monitoring plan written by JBR Consultants, designed to address various issues in the above-referenced permit. You may recall that as a result of an NOV issued to ANDALEX in January (N06-49-1-1), a couple of ambiguous issues were discovered in the MRP which were discussed at our informal assessment conference. It was felt that a good way to address these and other issues in the MRP was to revamp the antiquated water monitoring plan which has been in place since 1982.

During the transition from ANDALEX to UtahAmerican Energy we have regretfully fallen behind on submittals both to the Division and to other agencies; we are currently making every effort to catch up. If the Division finds this plan to be acceptable, it will be incorporated into the MRP.

Also enclosed is the appropriate C1 form; we appreciate your patience and understanding during this transition period.

Sincerely,

Michael W. Glasson
Senior Geologist

RECEIVED
OCT 13 2006
DIV. OF OIL, GAS & MINING

APPLICATION FOR PERMIT PROCESSING

Permit Change X	New Permit ☐	Renewal ☐	Transfer ☐	Exploration ☐	Bond Release ☐	Permit Number: C/007/019
Title of Proposal: Centennial Water Monitoring Plan.						Mine: Centennial Project
						Permittee: Andalex Resources

Description, include reason for application and timing required to implement: Proposed Surface and Ground Water Monitoring.

Instructions: *If you answer yes to any of the first 8 questions (gray), submit the application to the Salt Lake Office. Otherwise, you may submit it to your reclamation*

☐ Yes	X No	1. Change in the size of the Permit Area? ___ acres Disturbed Area? ___ acres X increase ☐ decrease.
☐ Yes	X No	2. Is the application submitted as a result of a Division Order? DO #
☐ Yes	X No	3. Does application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes	X No	4. Does application include operations in hydrologic basins other than as currently approved?
☐ Yes	X No	5. Does application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes	X No	6. Does the application require or include public notice/publication?
☐ Yes	X No	7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes	X No	8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
X Yes	☐ No	9. Is the application submitted as a result of a Violation? NOV # N06-49-1-1
☐ Yes	☐ No	10. Is the application submitted as a result of other laws or regulations or policies? Explain: Division Request
☐ Yes	X No	11. Does the application affect the surface landowner or change the post mining land use?
☐ Yes	X No	12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2?)
☐ Yes	X No	13. Does the application require or include collection and reporting of any baseline information?
☐ Yes	X No	14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes	X No	15. Does application require or include soil removal, storage or placement?
☐ Yes	X No	16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☐ Yes	X No	17. Does the application require or include construction, modification, or removal of surface facilities?
X Yes	☐ No	18. Does the application require or include water monitoring, sediment or drainage control measures?
☐ Yes	X No	19. Does the application require or include certified designs, maps, or calculations?
☐ Yes	X No	20. Does the application require or include subsidence control or monitoring?
☐ Yes	X No	21. Have reclamation costs for bonding been provided for?
☐ Yes	X No	22. Does application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes	X No	23. Does the application affect permits issued by other agencies or permits issued to other entities?

X Attach 5 complete copies of the application.

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Signed - Name - Position - Date

Subscribed and sworn to before me this 10 day of October, 20 06.

Notary Public

My Commission Expires: 06-16-10 20 10

Attest: STATE OF UTAH COUNTY OF Carbon

ROCHELLE WOOD
NOTARY PUBLIC • STATE OF UTAH
90 NORTH 400 EAST PO BOX 544
WELLINGTON, UT 84542
COMM. EXP. 06-16-2010

Received by Oil, Gas & Mining

RECEIVED

OCT 13 2006

DIV. OF OIL, GAS & MINING

ASSIGNED TRACKING NUMBER

Application for Permit Processing
Detailed Schedule of Changes to the MRP

Title of Application: Centennial Water Monitoring Plan.	Permit Number: C/007/019
	Mine: Centennial Project
	Permittee: Andalex Resources

Provide a detailed listing of all changes to the mining and reclamation plan which will be required as a result of this proposed permit application. Individually list all maps and drawings which are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise the existing mining and reclamation plan. **Include page, section and drawing numbers as part of the description.**

			DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
☐ ADD	X REPLACE	☐ REMOVE	Proposed Surface and Ground Water Monitoring Plan
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	

Any other specific or special instructions required for insertion of this proposal into the Mining and Reclamation Plan?

RECEIVED
OCT 13 2006
DIV. OF OIL, GAS & MINING

ANDALEX RESOURCES, INC.
CENTENNIAL MINE

OPERATIONAL WATER MONITORING PLAN

August 2006

Submitted to:

Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114-5801

Submitted by:

ANDALEX Resources, Inc.
P.O. Box 907
Price, UT 84501

Prepared by:

JBR Environmental Consultants, Inc.
8160 S. Highland Drive
Sandy, Utah 84093
(801) 943-4144

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ANDALEX RESOURCES, INC.
CENTENNIAL MINE

OPERATIONAL WATER MONITORING PLAN

Introduction

ANDALEX Resources, Inc. operates an underground coal mine in the Book Cliffs coal field several miles north of Price under Utah Division of Oil, Gas and Mining (UDOGM) mine permit C007/019. Known as the Centennial Mine, and in operation since 1980, it encompasses several separate mining units known individually as the Tower, Pinnacle, and Aberdeen Mines. Prior to beginning mining operations, and continuing to the present, ANDALEX has monitored the quantity and quality of surface water and groundwater according to the requirements of the Utah Coal Regulatory Program, as promulgated under UAC R645-301. In addition, when intercepted groundwater discharges from the mine, as allowed under a Utah Pollutant Discharge Elimination System (UPDES) permit (No. UT0025674) issued by the Utah Division of Water Quality, ANDALEX monitors those discharges according to UPDES permit requirements.

As the mining area expands, changes are made to the permit boundary, and new monitoring sites are added. As a result, several different monitoring plans have been developed for the Centennial Mine. These are described to varying extents in separate Probable Hydrologic Consequences (PHC) determinations that are appended to the Mining and Reclamation Plan (MRP) and within the MRP hydrology chapter (Chapter 7). There is no single, complete document that outlines all current monitoring requirements; this results in discrepancies and inconsistencies.

This operational monitoring plan has been written to correct these discrepancies and to provide an up-to-date, comprehensive document that details all operational monitoring requirements. It supersedes all other versions of monitoring plans that have been developed for the Centennial Mine. This plan draws from the various monitoring plans that have previously been written and approved. It is also based upon an assessment of monitoring data collected to date, along with knowledge of future mine plans. This comprehensive operational monitoring plan will continue to meet the requirements of R645-301-731.211 and R645-301-731.221, i.e., to document the suitability of water for current and approved postmining land uses and for protecting the hydrologic balance.

Any future changes to operational monitoring requirements at the Centennial Mine will be reflected in revisions to this document, and in that way, it will be maintained as a complete and accurate record of approved monitoring requirements.

Site Locations and Descriptions

The operational water monitoring plan includes surface water (stream channels) and groundwater (wells and springs). In addition, mine discharge and storm water is monitored at four other sites according to UPDES permit requirements. All monitoring sites are shown on **Figure 1**. Later sections of this report discuss the monitored parameters and the monitoring frequency for these sites. Site locations and descriptions are provided below in **Tables 1 and 2**.

As allowed by R645-301-731.214 and R645-301-731.224, several sites that have been monitored for many years have been omitted from this plan. Sites in Hoffman Canyon (S25-1 and 25-2), Straight Canyon (8-1 and 17-2), and upper Star Point Fork (17-1) will no longer be monitored. All of these sites are located within or near the eastern portion of the MRP boundary. Current and future mining activities are well to the north and west of this area. Further justification for discontinuing monitoring is provided below.

ANDALEX has completed mining under Hoffman Canyon; there were no surface facilities associated with mining in that area and there has been no subsidence reported during annual surveys. Because the spring (S25-1) flows only intermittently and the stream (25-2) flows only ephemerally, few samples have been collected. However, based upon the available data, there has not been any material damage to the hydrologic balance, and postmining land uses have not been compromised. Nor would there be any potential for this to occur in the future from these completed activities.

Similarly, ANDALEX has completed mining under Straight Canyon and Starpoint Fork. These sites were originally designated for monitoring to indicate effects of proposed surface facilities in those canyons (Vaughn Hansen Associates 1981); these facilities were never constructed and are no longer proposed. Further, annual subsidence surveys have not indicated subsidence. Though there have been few opportunities to collect water quality samples from these ephemeral channels, available data has not indicated any material damage to the hydrologic balance, and postmining land uses have not been compromised. Nor would there be any potential for this to occur in the future from these completed activities.

For the reasons described above, monitoring at these five sites is no longer needed to achieve the stated purposes of monitoring. Beginning with the date of approval of this operational monitoring plan, sites S25-1, 25-2, 8-1, 17-1, and 17-2 will be discontinued.

Surface Water Monitoring

All surface water monitoring locations are shown on **Figure 1**. These monitoring sites are listed and briefly described in **Table 1**.

Table 1 Surface Water Monitoring Sites

Site ID	UTM location	Year Added to Plan	Description
7-1	523671.45 N 4395971.72 E	1981	Right Fork Deadman Canyon above main surface facilities, ephemeral stream
12-1	520905.53 N 4394877.79 E	1987	Alrad Canyon, ephemeral stream
18-2	523445.28 N 4393435.60 E	1981	Starpoint Fork above confluence with Deadman Canyon, ephemeral stream
18-3	522832.11 N 4394057.30 E	1981	Left Fork Deadman Canyon above confluence with Right Fork Deadman Canyon, ephemeral stream
18-4	522995.07 N 4394031.23 E	1981	Right Fork Deadman Canyon below main surface facilities, ephemeral stream
SC-1	523163.54 N 4399946.43 E	2004	Summit Creek below confluence of Left and Right Forks, and downstream of tract boundary
AC-1	522264.77 N 4399963.12 E	2005	Antone Creek below confluence of Left and Right Forks, and downstream tract boundary
B263	520606.46 N 4400844.74 E	2005	Deep Creek downstream of confluence with Buck Canyon, and downstream of tract boundary
31-1	522895.20 N 4397646.20 E	2005	Stock pond at head of Right Fork Summit Creek that receives seasonal surface runoff

Groundwater Monitoring

Groundwater monitoring includes two types of sites: underground water intercepted by a well; and springs representing surface expressions of natural groundwater discharge. **Figure 1** shows these sites. **Table 2** provides site locations and descriptions.

UPDES Monitoring

Storm water and mine water discharges at the Centennial Mine are covered under a UPDES Permit, administered by the Utah Division of Water Quality. This permit (No. UT0025674) requires monitoring at four locations, shown on **Figure 1** and designated as outfalls 001, 002, 003, and 004.

Outfalls 001 and 003 are downstream of sediment ponds and have never discharged. However, as required by the UPDES permit, Discharge Monitoring Reports (DMRs) are completed monthly, with "no discharge" reported as appropriate, and submitted to the Utah Division of Water Quality. This information is also reported to UDOGM. Further, if discharge were to occur, it would be sampled as required by the UPDES permit.

Outfall 002 discharges any intercepted groundwater from the Pinnacle Mine. Outfall 004 discharges any intercepted groundwater from a breakout in the Aberdeen Mine. When discharge occurs, it is sampled as required by the UPDES permit. Monthly DMRs are also completed appropriately for these outfalls, and submitted to Utah Division of Water Quality and UDOGM.

Table 2 Groundwater Monitoring Sites

Site ID	UTM location	Year Added to Plan	Description
Well No. 1	523236.53 N 4395172.22 E	1981	Well in Deadman Canyon, completed in Aberdeen Sandstone (first aquifer below coal seam)
S18-1	522923.25 N 4393720.43 E	1981	Spring in Deadman Canyon below confluence with Left and Right Forks Deadman Canyon
B351	520041.65 N 4398348.87 E	2002	Price River Formation spring in channel bottom of Upper Mathis Canyon, upstream of stock pond
B352	520638.61N 4398303.74 E	2002	North Horn Formation spring in Upper Mathis Canyon, on hillside adjacent to unnamed tributary
B362	521861.11 N 4399363.80 E	2005	Flagstaff Limestone spring in tributary to Right Fork Antone Creek drainage.
B261	520670.75 N 4400032.24 E	2005	Flagstaff Limestone spring (named Pace Spring) in Deep Canyon upstream of pond

Monitoring Methodology and Parameters

Flow rate is measured at all spring and stream sites using equipment and methods that are appropriate for the amount of flow. Streams are typically measured with a current meter using the velocity/area approach, a submerged float/area method, or with a portable, calibrated flume. Springs are typically measured volumetrically with piping, a known-volume container, and a stopwatch. Notes on flow extent are made if appropriate. If flow rate is so reduced that it is not possible to measure (i.e. at a seasonal spring where saturated areas are present but no flow is visible), or if no flow is occurring (i.e. at an ephemeral stream site), notes are made describing the site condition (saturation, ponding, dry but recent flows apparent, etc.) Static water level is recorded at the monitoring well using a well sounder, and purged before samples are taken. Stock pond sites are observed for incoming flow, outgoing flow, and approximate percentage of storage; these are reported qualitatively with no quantitative measurements made and no samples collected.

Water temperature, pH, and conductivity are measured in the field using equipment that has been properly maintained and calibrated. Dissolved oxygen is also measured in the field at all flowing stream sites. These field parameters are measured at locations appropriate to the site: for streams, in mid-stream, non-stagnant water, with temperature measurements occurring in shaded areas where possible; and for springs, as near to the source as possible. The monitoring well is purged prior to measuring field parameters.

Samples for chemical analysis follow requirements of UAC R645-301-723. The parameter list for surface waters (except stock ponds as described above) is shown in **Table 3**, and the list for groundwater is shown in **Table 4**. Any samples collected at the four UPDES outfalls are analyzed for the abbreviated parameter list required by the UPDES permit. When feasible, field filtering is done prior to filling a bottle for dissolved metals analysis. Samples are stored in iced coolers and submitted to a contract lab using proper chain-of-custody procedures. The lab is certified for all parameters that it analyzes.

Recent PHCs (Mayo and Associates 2002; Petersen Hydrologic 2004) prepared for various amendments to ANDALEX's permit have considered the potential impact to water sources as a result of mining activities as negligible, remote, and extremely unlikely. These PHCs state that the primary purpose of monitoring these locations is to verify that the temporal variations in groundwater and surface water discharge are the result or climatic and seasonal variability. The parameter lists provided in **Tables 3** and **4** below support this purpose, and reflect the lists contained in those approved PHCs.

Table 3 Surface Water Parameter List

Field Parameters	
pH	Water temperature
Conductivity	Dissolved oxygen
Flow rate	
Laboratory Parameters	
Bicarbonate	Alkalinity
Carbonate	TDS
Calcium (dissolved)	Hardness
Chloride	Iron (total and dissolved)
Magnesium (dissolved)	Manganese (total and dissolved)
Potassium (dissolved)	Oil & Grease
Sodium (dissolved)	TSS
Sulfate	Cation/anion balance

Table 4 Groundwater Parameter List

Field Parameters	
pH	Water temperature
Conductivity	Static water level or flow rate
Laboratory Parameters	
Bicarbonate	Sulfate
Carbonate	Alkalinity
Calcium (dissolved)	TDS
Chloride	Hardness
Magnesium (dissolved)	Iron (total and dissolved)
Potassium (dissolved)	Manganese (total and dissolved)
Sodium (dissolved)	Cation/anion balance

Monitoring Frequency and Schedule

Surface water and groundwater monitoring sites are visited quarterly, when accessible. When flowing, field measurements are made and samples are collected for lab analysis. When not flowing, condition is documented and subsequently reported.

UPDES outfall sites are on a monthly monitoring schedule, as required by the UPDES permit.

Reporting

Quarterly monitoring results are reported electronically to UDOGM's on-line database.

UPDES results are submitted to the Utah Division of Water Quality on a monthly basis, and are entered into UDOGM's database each quarter.

References

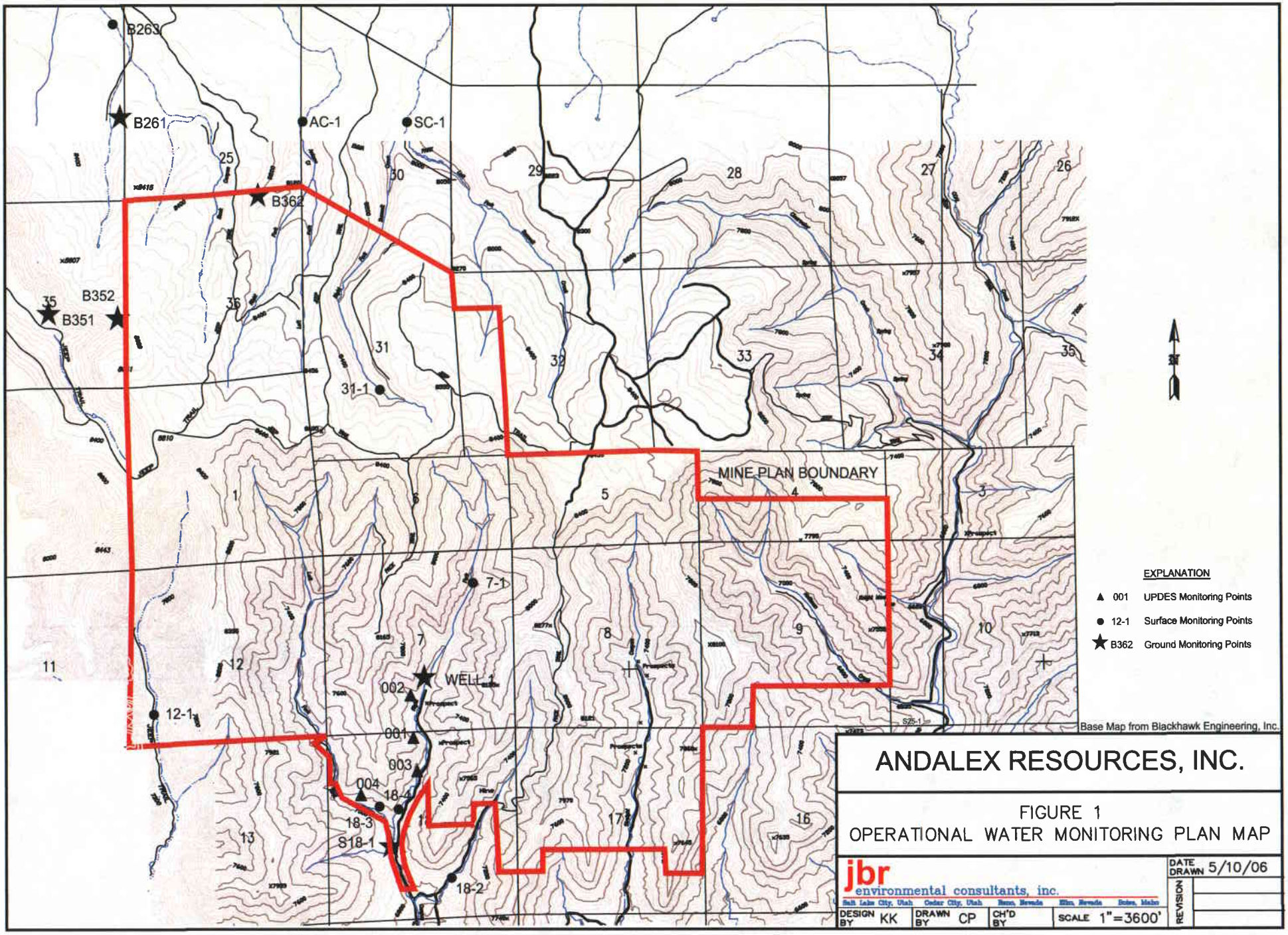
Mayo and Associates, 2002. Determination of the Probable Hydrologic Consequences of Coal Mining in the 240-acre IBC at the ANDALEX Resources, Inc. Tower Mine, Carbon County, Utah. Prepared for ANDALEX Resources, Inc., Price, Utah, 19 April 2002. Contained in Appendix L of Centennial's MRP.

Petersen Hydrologic, 2004. Probable Hydrologic Consequences of Coal Mining in the Summit Creek and North Mathis Tracts, ANDALEX Resources, Inc., Tower Mine. Prepared for ANDALEX Resources, Inc., Price, Utah, 6 April 2004. Contained in Appendix L of Centennial's MRP.

Vaughn Hansen Associates. 1981. Surface and Groundwater Hydrologic Inventory of the Tower Mine Plan and Adjacent Areas, Carbon County, Utah -- The Centennial Project. Prepared for Tower Resources, Inc. Price, Utah, February 1981. Contained in Appendix L of Centennial's MRP.

FIGURES

drawings\ANDAL-05c\Fig1 Operational Water Monitoring Plan Map.dwg



ANDALEX RESOURCES, INC.

FIGURE 1
OPERATIONAL WATER MONITORING PLAN MAP

jbr environmental consultants, inc.
Salt Lake City, Utah Cedar City, Utah Reno, Nevada Elko, Nevada Boise, Idaho

DESIGN BY	DRAWN BY	CH'D BY	SCALE	DATE DRAWN	REVISION
KK	CP		1"=3600'	5/10/06	